

Factor the following expressions:

$$(2x-5)(2x+5)$$

$$\begin{aligned} & \textcircled{2} (3x^2 - 10x - 8) \\ & (3x^2 - 12x + 2x - 8) \\ & 3x(x - 4) + 2(x - 4) \\ & \boxed{2(x - 4)(3x + 2)} \end{aligned}$$

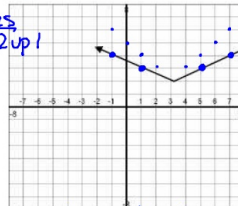
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Midterm Review

Date _____ Per _____

1.) YOU TRY: Determine the equation of the graph below:

$a = \frac{1}{2}$
 $\begin{pmatrix} h & k \\ (3, 2) \end{pmatrix}$



$$y = a|x-h| + k$$

$$y = \frac{1}{2}|x-3| + 2$$

2.) YOU TRY: Hertz Rent-A-Car charges a daily fee of \$55 and .20 cents for every mile. The local competition charges \$25 a day and .59 cents for every mile. If you rent a car for 4 days and drive 250 miles, which is the better value?

<u>Hertz</u>	}	<u>Competition</u>
$45d + .30m$		$35d + .50m$
$45(3) + .30(300)$		$35(3) + .50(300)$
\$225		\$255

1.2 Answer: Hertz

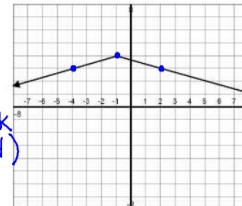
$$y = 2x^2 + 6x + 3$$

$$y = 2x^2 + 6x + 3$$

$$0 = 2x^2 + 6x + 3 - \frac{6 \pm \sqrt{6^2 - 4(2)(3)}}{2(2)}$$

$$\frac{-6 \pm \sqrt{12}}{4} = \frac{-6 \pm 2\sqrt{3}}{4} = \frac{-3 \pm \sqrt{3}}{2}$$

Zeros: $\frac{-3 \pm \sqrt{3}}{2}$



$$y = -\frac{1}{3}|x+1| + 4$$

2.) YOU TRY: Hertz Rent-A-Car charges a daily fee of \$55 and .20 cents for every mile. The local competition charges \$25 a day and .59 cents for every mile. If you rent a car for 4 days and drive 250 miles, which is the better value?

<u>Hertz</u>	<u>CompuTutor</u>
$55d + .20m$	$25d + .59m$
$55(4) + .20(200)$	$25(4) + .59(250)$
\$270	\$247.50

Answer: Competitor

$$2x^2 + 39 = -18x$$

$2x^2 + 18x + 39 = 0$ $2x^2 + 39 = -18x$

$$\frac{-18 \pm \sqrt{18^2 - 4(2)(39)}}{2(2)}$$
 calc

$$\frac{-18 \pm \sqrt{12}}$$

$$\frac{-18 \pm 2\sqrt{3}}{4}$$

 Zeros: $\frac{-9 \pm \sqrt{3}}{2}$

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4.) Which of the following choices represents the following transformation

$$y = |x| \quad \text{to} \quad y = |x + 5| - 3$$

$(0,0)$ $(-5,-3)$

- ☒ a. Horizontal shift 5 units right, vertical shift 3 units down
☒ b. Horizontal shift 5 units right, vertical shift 3 units up
☒ c. Horizontal shift 5 units left, vertical shift 3 units down
☐ d. Horizontal shift 5 units left, vertical shift 3 units up

4.) YOU TRY: Which of the following choices represents the following transformation

$$y = x^2 \quad \text{to} \quad y = (x - 1)^2 + 7$$

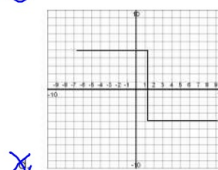
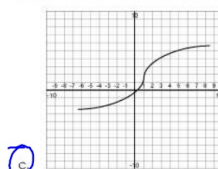
$(0,0)$ $(1,7)$

- ☐ a. Horizontal shift 1 units right, vertical shift 7
☒ b. Horizontal shift 1 units right
☒ c. Horizontal shift 1 units left, vertical
☒ d. Horizontal shift 1 units left, vertical

5.) Which of the following relationships are functions?

- ☒ a. $\{(4,6), (5,2), (-4,7), (3,6), (6,3)\}$
☒ b. $\{(3,-6), (5,2), (-4,7), (3,6), (2,5)\}$

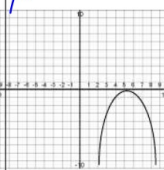
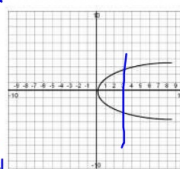
repeat in domain (x)
means not a function



vertical line test

5.) YOU TRY: Which of the following relationships are functions?

- ☒ a. $\{(1,2), (3,4), (-1,-2), (-3,-4)\}$
☒ b. $\{(1,2), (-1,2), (1,3), (-1,3)\}$



6.) Determine the value of b if the solution to the equations is $x = -13$

$$\frac{x^2 + bx + 6}{-2x + 7} = 12$$

6.) YOU TRY: Determine the value of b if the solution to the equations is $x = -4$

$$\frac{x^2 + bx - 2}{3x - 5} = -2$$

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$$b = \underline{\hspace{2cm}}$$

7.) Given $f(x) = x^2 + 4x + 1$, which of the following is equivalent?

- a. $f(x) = (x + 2)^2 + 3$
b. $f(x) = (x + 2)^2 - 3$
c. $f(x) = (x - 2)^2 + 3$
d. $f(x) = (x - 2)^2 - 3$

$$b = \underline{\hspace{2cm}}$$

7.) YOU TRY: Given $f(x) = x^2 + 6x + 3$, which of the following is equivalent?

- a. $f(x) = (x + 3)^2 + 6$
b. $f(x) = (x - 3)^2 - 6$
c. $f(x) = (x - 3)^2 + 6$
d. $f(x) = (x + 3)^2 - 6$

8.) What are the zero's of the following polynomial function $f(x) = x^3 - x^2 - 9x^2 + 9$

Zeros: $\underline{\hspace{2cm}}$

9.) When is the function $x^2 - 3x - 18$ decreasing?

Decreasing: $\underline{\hspace{2cm}}$

10.) Determine the value of x which would make the statement true.

$$2i^2(5 + i) + 3i = 2 + xi$$

- a. $x = 11$
b. $x = -7$

8.) YOU TRY: What are the zero's of the following polynomial function $f(x) = x^4 - 25x^2 - 4x^2 + 100$

Zeros: $\underline{\hspace{2cm}}$

9.) YOU TRY: When is the function $-x^2 + 9x - 20$ increasing?

Decreasing: $\underline{\hspace{2cm}}$

10.) YOU TRY: Determine the value of x which would make the statement true.

$$-3i^2(3 + 2i) - 2i = -6 + xi$$

- a. $x = 7$
b. $x = -7$

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c. $x = -2$
d. $x = 3$

c. $x = 1$
d. $x = -1$

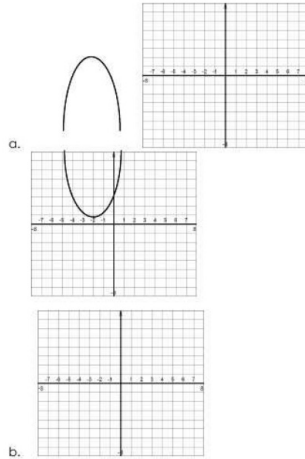
11.) Which of the following is equivalent to
 $x^2 + 18x + 100 = 20$

- a. $(x + 9)^2 = 1$
b. $(x + 9)^2 = -1$
c. $(x - 9)^2 = 1$
d. $(x - 9)^2 = -1$

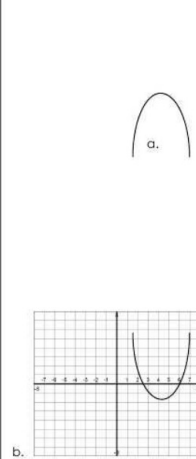
11.) YOU TRY: Which of the following is equivalent to
 $x^2 + 2x + 9 = 24$

- a. $(x - 1)^2 = 16$
b. $(x - 1)^2 = -16$
c. $(x + 1)^2 = 16$
d. $(x + 1)^2 = -16$

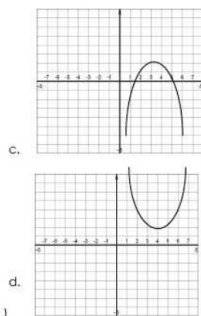
12.) Which of the following is the graph of
 $f(x) = -(x - 3)^2 + 2$



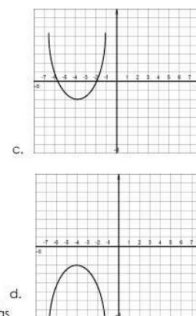
12.) YOU TRY: Which of the following is the graph of
 $f(x) = (x + 4)^2 - 2$



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12.) A rectangular box has sides of lengths 6, 8 and 10. If each side is increased by x inches, determine the volume function that would model this rectangular box.

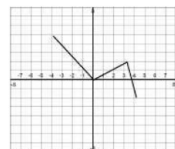


12.) YOU TRY: A rectangular box has sides of lengths 2, 3, 4. If each side is decreased by x inches, determine the volume function that would model this rectangular box.

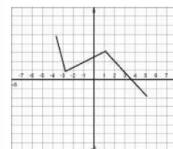
Volume: _____

Volume: _____

13.) The following graph is $f(x)$, graph $f(x + 2) - 3$



13.) The following graph is $f(x)$, graph $f(x - 3) + 1$



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